EYE BANK ASSOCIATION of AMERICA

1988 EYE BANKING ACTIVITY SETS RECORD

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Introduction

This report details the sources and uses for eye and corneal donations in 1988, and it offers an analysis of trends within eye banking. The data is based upon 106 reporting eye banks in the United States and Canada. See Appendix 1 for background information on eye donation, corneal transplantation, and eye banking.

Overview of Statistics

Table 1: Total Donations and Uses

	1987	1988
Donations		
Whole Eyes	55,633	57,940
Corneal Only	24,843	25,818
All Donations	80,476	83,758
Uses		
Corneal Grafts	35,930	36,900
Epikeratophakia	8,367	5,204
Donations for Res., Trg.	35,427	37,051
Tissue Retained For Later Use	N/A	2,816
Not Used For Medical/Safety Purposes	725	2,747
	(107 Eye Banks)	(106 Eye Banks)

In 1988 a record number of 83,621 eyes and corneas were donated by humanitarian citizens, 4.0 percent higher than the previous record total of 80,476 in 1987. A record 36,900 corneas were supplied for transplant, 1,159 (3.2 percent) more than the previous record in 1987.

In 1988, 37,051 eyes were used for research and teaching programs. Another 5,204 corneas were provided for epikeratophakia, a surgical procedure that corrects refractive errors for patients with high degrees of vision loss. Of the total number of eyes and corneas donated, 44.1 percent were used for corneal transplants, 44.2 percent for research and teaching, 6.2 percent for epikeratophakia, 3.4 percent were frozen or retained for later use, and 3.3 percent were discarded after evaluation for patient safety purposes. (The total of the percentages exceeds 100 because an eye sometimes can be used for more than one purpose, including the cornea for transplant and the rest of eye for research or teaching.)

The 4.0 percent increase in overall donations from 1987 to 1988 is much lower than the average annual rise during the 1980s. For example, the figures rose 19.0 percent from 1986 to 1987.

Variations in Activity Among Eye Banks

Eye banks vary greatly in the size of their territory, population, programs, staff, board of directiors, and medical advisors. The data in Table 2 support these differences.

Table 2: Total Eye and Corneal Donations Obtained by Eye Banks
Number of Eye and Corneal Donations

	Ø-99	100-299	300-599	600-999	1000-1999	2000+
# of Eye Banks 1987 (n=107)	17	24	24	17	14	11
% of Total Donations	1.1%	5.6%	13.3%	17.7%	23.2%	39.1%
# Of Eye Banks 1988 (n=106)	17	22	23	14	18	12
% of Total Donations	1.1%	5.4%	11.6%	12.2%	31.0%	38.6%

The above figures indicate two trends:

(1) The number of larger eye banks is growing. In 1988, 30 eye banks obtained 1000 or more donations, versus 25 in 1987.

(2) A significant proportion of the eye banks (17 in both years) still is obtaining less than two per cent of the total eyes and corneas donated.

Comparison By Number of Grafts Performed

The demand for corneas for transplant varies greatly among the areas served by the various eye bank. Listed below are data for eye banks showing corneas used locally for transplant. The distribution of these changed from 1987 to 1988. Four more eye banks now are in the largest two categories, and eight less are in the middle category.

Table 3: Eye Banks By Number of Grafts Performed Locally

Number of Grafts

	Ø-49	50-199	200-499	500-999	1000 +
# of Eye Banks 1987 (n=107)	16	38	35	14	4
% of Eye Banks	15.9%	35.5%	32.7%	13.1%	3.8%
# of Eye Banks 1988 (n=106)	13	42	27	17	5
% of Eye Banks	12.3%	39.6%	25.4%	16.0%	4.7%

Eye Banks Sharing Corneas for Transplant

The first priority for the use of corneas, except in cases of emergency surgery, is in the local area where they are donated. Corneas are shared with other eye banks or corneal surgeons when a temporary surplus or a need exists. Corneas generally have to be transplanted within a week to 10 days after donation, depending on the method of storage. Unlike organs, corneas in over 90 percent of the cases do not require tissue typing, so matching a cornea with a recipient is not as necessary.

The distribution pattern for corneas in 1988 was almost identical to that in 1987. In 1988, 25,309 of the eyes and corneas donated locally were used locally in corneal transplants, versus 24,970 in 1987. In 1988, 11,591 corneas (31.4 percent of total transplants) were shared, versus 11,320 (31.2 per cent of surgical tissue) in 1987.

As in 1987, the majority of the shared corneas is shipped by a small number of eye banks. In 1988, the 10 eye banks which shared over 300 corneas accounted for 56.3 percent of the total, versus the nine eye banks sharing over 300 corneas in 1987 accounting for 55.7 percent.

Of the 11,591 corneas shared for transplant, 9,396 (81.8 percent) were shared in the United States and Canada, and 2,222 (18.2 per cent) were shared outside of that area. The trend is slowly growing toward more eye banks sharing a larger amount of corneas, although nearly half annually share fewer than 20.

Table 4: Eye Banks By Number of Corneas Shared For Transplant

	Corneas				
	0-19	20-49	50-99	100-299	300+
# of Eye Banks 1987 (n=107)	52	15	14	17	9
% of Eye Banks	48.6%	14.0%	13.1%	15.9%	8.4%
# of Eye Banks 1988 (n=106)	45	19	12	20	10
% of Eye Banks	42.5%	17.9%	11.3%	18.9%	9.4%

Eye Banks Receiving Shared Corneas

Eye banks receive shared corneas for surgery from another eye bank during those times when the local supply of corneas does not meet the local need. The distribution of those receiving shared corneas in 1988 is almost identical to that in 1987. The only difference worth noting is that in 1988, five eye banks received 200 or more corneas versus only two eye banks in 1987.

Table 5: Eye Banks By Number of Shared Corneas Received For Surgery

	Number of Grafts				
	Ø-19	2Ø-49	5Ø-99	1ØØ-199	2ØØ+
# of Eye Banks 1987 (n=1Ø7)	66	16	14	9	2
% of Eye Banks	61.7%	15.Ø%	13.Ø%	8.4%	1.9%
# of Eye Banks 1988 (n=1Ø6)	65	15	14	7	5
% of Eye Banks	61.3%	14.2%	13.2%	6.6%	4.7%

Sources of Donations

Between 1987 and 1988, the data on the distribution of sources does not change much, except that more corneas and eyes are coming from families being approached in hospitals, which is a direct result of eye banks working to assist hospitals in complying with required request laws.

Table 6: Sources of Donations

Whole Eyes

	1988	1987
Hospital	48,662 (84%)	48,484 (87%)
Funeral Director	7,795 (15%)	4,916 (9%)
Medical Examiner	45Ø (1%)	829 (1%)
Other Sources	1,Ø36 (2%)	1,4Ø4 (3%)
Total	57,94Ø	55,633

Corneas

	1988	1987
Hospital	9,917 (38%)	7,712 (31%)
Funeral Director	86 (Ø%)	285 (1%)
Medical Examiner	15,169 (59%)	16,567 (67%)
Other Sources	646 (3%)	279 (1%)
Total	25,818	24,843

Limitations of This Report

Two eye banks did not report data, so their 1987 data were used. Every effort has been made to obtain data from all entities in North America, but several programs did not respond. If all the data were reported, the additional information would likely increase the total figures by less than five percent. The trends described in this report also would not change significantly. All data are self-reported by each eye bank. Data is not included from physicians who obtain or receive eyes without using their local eye bank.

Conclusions

Although eye donations continue to rise each year, much work remains to be done. About 3,500 to 5,000 North Americans still were waiting for transplants as of January 1, 1989, because of a shortage of donated corneas.

The average waiting time in North America still remains at about one to two months. The reasons for being on a waiting list for corneal transplant surgery are quite different from those for being on an organ transplant waiting list. Those waiting for organs do so because of a more severe shortage of organs than corneas and because of the greater need for specific matching of medical characteristics between recipients and organ donors. People appear on a corneal transplant waiting list for several reasons. The major reason is that in many areas the demand for corneas for a transplant exceeds the amount available. A small number of patients are waiting for antigen matched corneas to help to minimize the chances of rejection.

The improvements in eye banking in the 1980s, coordinated by the Eye Bank Association of America and the American Academy of Ophthalmology have greatly increased the number of people who can see due to corneal transplants and refractive surgery. Cooperation between eye banks, tissue banks and organ procurement organizations also is strengthening procurement programs.

Eye banking has been assisted by the growing public support for organ and tissue donation, as evidenced by state and federal laws requiring that the option of organ and tissue donation be considered in cases of hospital deaths. Although hospital donors reached a record high in 1988, eye banks can do much more to assist hospital officials in complying with required request laws.

Societal factors also are impacting on all of organ and tissue donation. For example, the growing concern over AIDS and other infectious diseases has made donor screening criteria stricter, therefore, reducing the number of suitable donors. To maintain the highest standards of patients safety, while meeting the growing need for eye and corneal donations for transplantation, refractive surgery and research, additional efforts must be made to increase the number of people approached about donation.

To achieve this goal, the EBAA will continue to develop programming:

* to maintain quality control in eye banking
* to enhance public and professional education
* to improve networking among eye banks
* to strengthen smaller eye banks
* and to help others outside of North America manage their own self sufficient eye banks.

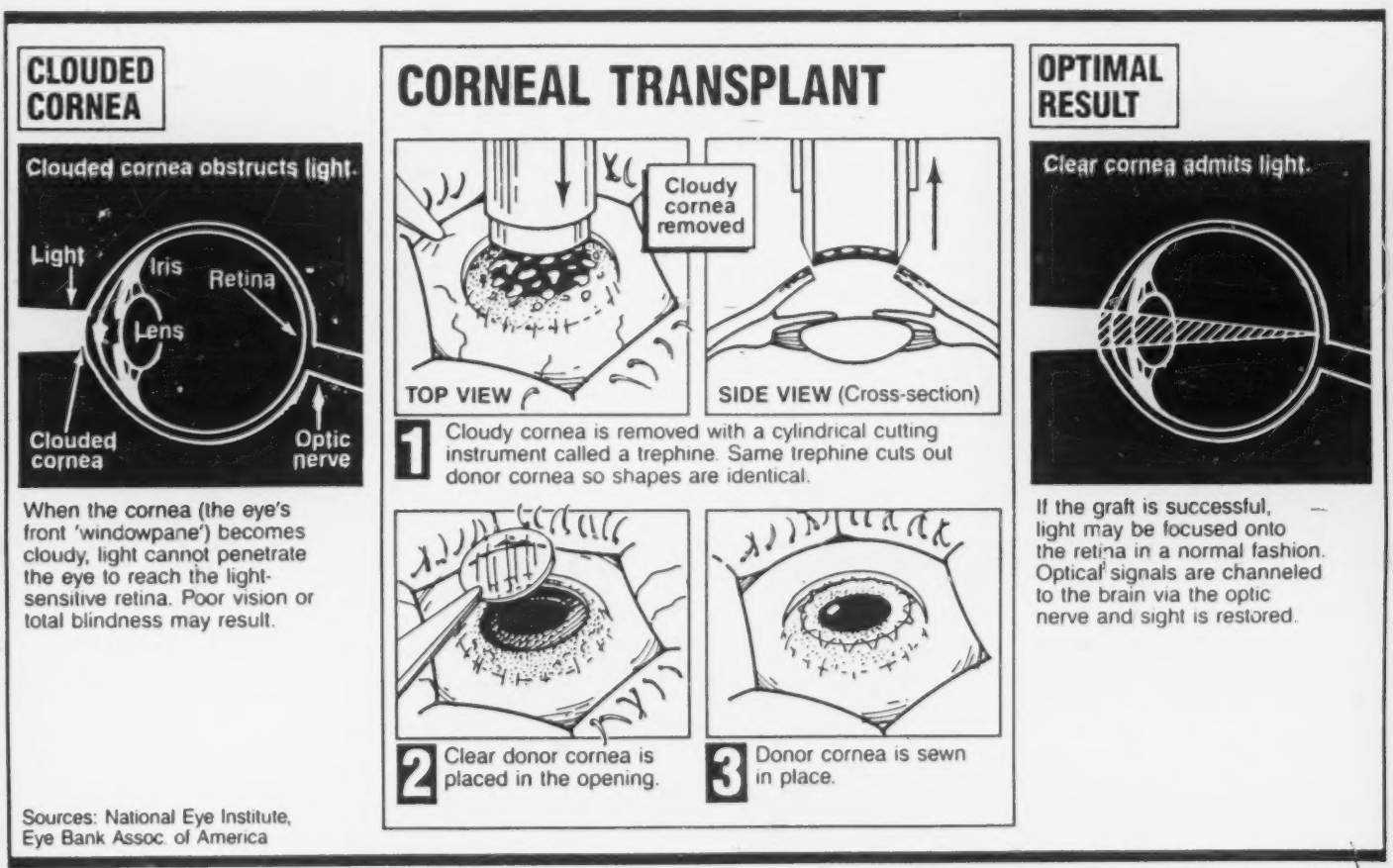
This dedication will assist eye banks in obtaining the large amount of corneas needed to eliminate the waiting list for sight-restoring surgery and to assist researchers in the discovery of treatments and solutions for many sight-hindering conditions.

Appendix 1- Facts About Eye Donation, Corneal Transplantation, and Eye Banking

The cornea, the clear surface at the front of the eye, is the main focusing element of the eye. If the cornea becomes cloudy from inherited disease, injury, infections, chemical burns, congenital disease, or many other causes, vision can be dramatically reduced. Not all donated eyes have corneas suitable for transplant because of the donor's medical history, or the cornea may not be clear enough to be transplanted.

All eyes not used for transplant are used for valuable research or teaching programs. Human eyes are vital, and in many cases have no substitute, for the study of many ophthalmic problems, such as diabetes, glaucoma, and retinal disease. An eye donation sometimes can be used for more than one purpose with the cornea being used for transplant, and the rest of the eye for valuable research or training.

An eye bank's mission is to have corneas readily available for anyone who needs a transplant, and to supply tissue for refractive surgery and valuable research and teaching programs.


CLOUDED CORNEA
Clouded cornea obstructs light.
Light
Iris
Retina
Lens
Clouded cornea
Optic nerve
When the cornea (the eye's front 'windowpane') becomes cloudy, light cannot penetrate the eye to reach the light-sensitive retina. Poor vision or total blindness may result.
CORNEAL TRANSPLANT
Cloudy cornea removed
TOP VIEW
SIDE VIEW (Cross-section)
1 Cloudy cornea is removed with a cylindrical cutting instrument called a trephine. Same trephine cuts out donor cornea so shapes are identical.
2 Clear donor cornea is placed in the opening.
3 Donor cornea is sewn in place.
OPTIMAL RESULT
Clear cornea admits light.
If the graft is successful, light may be focused onto the retina in a normal fashion. Optical signals are channeled to the brain via the optic nerve and sight is restored.
Sources: National Eye Institute, Eye Bank Assoc. of America

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1988 ACTIVITY REPORT -- SUMMARY BY CITY

CITY (alpha by state)

	TOTAL DONATIONS	LOCAL GRAFTS	LOCAL RES/TRG	SHARED GRAFTS	EPI TISSUE	SHARED RES/TRG	DISCARDED FOR SAFETY	RETAINED	TOTAL CORNEA GRAFTS
BIRMINGHAM	1657	620	413	357	52	198	351	23	977
SHEFFIELD	67	11	13	8	6	26	0	3	19
PHOENIX	2094	379	615	579	13	384	122	2	958
LITTLE ROCK	308	138	128	26	10	0	0	0	164
FRESNO	269	76	8	155	0	2	28	0	231
IRVINE-UCI	200	69	75	23	9	0	8	15	92
LOMA LINDA	1286	195	284	412	201	172	24	0	607
LOS ANGELES-DOHENY	2766	1011	483	549	448	8	258	92	1560
LOS ANGELES-UCLA	112	49	18	34	0	0	0	5	83
ORANGE COUNTY	900	207	111	343	141	27	0	71	55
SACRAMENTO	361	211	124	6	0	20	0	0	2.
SAN DIEGO	2244	531	878	647	34	108	0	80	1178
SAN FRANCISCO	814	447	165	76	0	2	124	0	523
DENVER-CO	67	20	30	9	0	0	8	0	29
DENVER-LIONS	1593	408	410	328	292	16	139	0	736
NEW BRITAIN	770	243	490	0	0	37	0	0	243
WILMINGTON	532	193	98	71	135	2	15	0	264
DIST. OF COL.-LIONS	492	41	295	122	30	0	0	2	163
DIST. OF COL.-TBI	302	57	152	0	27	0	0	2	57
MIAMI	2038	1438	600	0	0	0	0	0	1438
ORLANDO	2795	558	30	226	609	1199	0	173	784
TAMPA	1319	439	809	32	38	1	0	0	471
TAMPA - FL. REG.	1296	321	30	274	0	290	0	219	595
ATLANTA	1572	843	624	20	83	2	0	0	863
AUGUSTA	271	101	140	3	0	0	27	0	104
HONOLULU	35	32	0	0	0	2	1	0	32
BOISE	164	48	65	33	4	8	2	4	81
BLOOMINGTON	179	52	56	31	0	22	18	4	83
INDIANAPOLIS-LIONS	681	172	435	35	1	0	8	30	207
INDIANAPOLIS-METH	90	61	0	7	0	0	22	0	68
IOWA CITY	708	267	391	50	0	0	0	0	317
KANSAS CITY-KS	612	90	374	63	0	30	55	0	153
WICHITA	288	67	40	16	20	20	121	0	83
LEXINGTON	662	231	368	88	0	0	0	0	319
LOUISVILLE	402	214	133	34	0	1	0	20	248
BATON ROUGE	89	38	30	9	0	10	2	0	47
NEW ORLEANS	401	150	215	12	6	3	15	0	162
SHREVEPORT	402	101	38	110	103	2	43	5	211
BALTIMORE	3633	276	1233	931	703	257	198	4	1207
BOSTON	1274	545	402	29	99	0	111	135	574
ANN ARBOR	3144	1941	939	94	170	0	0	0	2035
MARQUETTE	60	2	2	10	0	0	46	0	12
MINNEAPOLIS	2101	516	1218	105	23	114	0	125	621
ROCHESTER-MN	617	85	515	17	0	0	0	0	102
JACKSON	207	120	81	7	0	0	0	0	127
COLUMBIA	1032	170	699	135	0	6	22	0	305
KANSAS CITY-MO	1076	202	764	35	0	69	6	0	237
ST. LOUIS-ARC	438	109	324	5	0	0	0	0	114
ST. LOUIS EYE BANK	518	210	259	2	42	0	0	5	212
MISSOULA	525	58	73	246	21	120	6	1	304
OMAHA	474	180	158	69	7	16	44	0	249
LAS VEGAS	90	59	8	21	0	0	2	0	80
NEWARK	408	157	188	0	0	0	8	55	157
ALBUQUERQUE	203	52	6	9	0	102	17	17	61

CITY (alpha by state)	TOTAL DONATIONS	LOCAL GRAFTS	LOCAL RES/TRG	SHARED GRAFTS	EPI TISSUE	SHARED RES/TRG	DISCARDED FOR SAFETY	RETAINED	TOTAL CORNEA GRAFTS
ALBANY	288	109	169	10	0	0	0	0	119
BUFFALO	302	173	47	11	49	4	18	0	184
MANHASSET	218	138	32	15	10	0	23	7	153
NEW YORK	1319	707	438	40	0	0	121	13	747
ROCHESTER-NY	1714	145	543	169	50	807	0	0	314
SYRACUSE	432	150	272	10	0	0	0	0	160
WINSTON-SALEM	1678	670	652	133	1	186	34	2	803
CANTON	70	48	5	3	6	8	0	0	51
CINCINNATI	1346	203	728	172	154	47	42	0	375
CLEVELAND	1723	498	561	217	101	277	69	0	715
COLUMBUS	768	203	551	5	0	0	0	0	208
DAYTON	758	197	375	136	40	10	0	0	333
TOLEDO	158	61	33	34	0	2	14	14	95
OKLAHOMA CITY	398	206	155	5	14	0	14	4	211
PORTLAND-LIONS	2421	247	1951	228	212	271	10	52	475
PORTLAND-UNIV	158	30	97	28	0	0	0	3	58
ERIE	202	17	80	6	0	10	55	34	23
PHILADELPHIA	1607	383	946	0	264	0	14	0	383
PITTSBURGH	1104	318	427	61	82	7	48	283	379
HATO REY	180	115	33	11	0	0	14	1	126
WEST COLUMBIA	410	169	241	11	0	0	8	0	180
SIOUX FALLS	76	2	22	24	0	28	0	0	26
CHATTANOOGA	158	74	30	44	0	0	3	7	118
KNOXVILLE	215	103	56	29	0	27	0	0	132
MEMPHIS	476	219	220	0	0	0	38	0	219
NASHVILLE	215	73	33	29	13	3	23	41	102
ABILENE *	18	2	2	4	0	10	0	0	6
AMARILLO	74	49	0	5	12	0	12	0	54
AUSTIN	338	161	32	136	0	0	3	6	297
CORPUS CHRISTI	244	130	39	55	47	25	34	9	185
DALLAS	929	435	293	96	22	0	0	0	531
EL PASO	294	91	2	161	3	0	23	0	252
FORT WORTH	309	100	144	4	4	0	57	0	104
HOUSTON	3814	773	846	1944	136	31	76	12	2717
LACKLAND AFB	30	22	0	8	0	0	0	0	30
LUBBOCK	34	5	20	7	2	0	0	0	12
ODESSA	14	5	0	5	0	2	2	0	10
SAN ANTONIO	628	290	189	149	0	0	0	0	439
TEMPLE	56	18	36	2	0	0	0	0	20
TYLER	25	6	0	15	0	0	4	0	21
SALT LAKE CITY	606	355	120	62	21	6	29	13	417
NORFOLK	584	71	219	183	3	48	0	0	254
RICHMOND	788	305	255	94	27	85	22	45	399
ROANOKE	132	29	103	0	0	0	0	0	29
SEATTLE	3068	610	354	143	308	500	28	1122	753
SOUTH CHARLESTON	379	107	0	128	95	49	0	0	235
MADISON	2199	288	1128	441	165	139	40	2	729
MILWAUKEE	1894	226	1605	14	0	26	12	11	240
SASKATOON	66	38	14	1	0	0	6	8	39
TORONTO *	1501	786	684	0	0	0	0	0	786
VANCOUVER	516	255	153	0	96	0	0	16	255
WINNIPEG	189	83	89	0	0	0	0	19	83
TOTALS	83,758	25,309	31,061	11,591	5,204	6,440	2,747	2,816	36,900
	TOTAL DONATIONS	LOCAL GRAFTS	LOCAL RES/TRG	SHARED GRAFTS	EPI TISSUE	SHARED RES/TRG	DISCARDED FOR SAFETY	RETAINED	TOTAL CORNEA GRAFTS

* 1987 figures